TRE-81-02

Implementation of the Axle Weight Control in Special Oversize / Overweight Permits

Ontario

Ministry of
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Policy
Planning and
Research Division

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Published by:
The Policy Planning and Research Division
Ontario Ministry of Transportation and Communications
Hon. James W. Snow, Minister
H.F. Gilbert, Deputy Minister

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Prepared for the
Oversize/ Overweight Permits Review Committee
Ministry of Transportation & Communications Ontario

February 1981

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IMPLEMENTATION OF THE AXLE WEIGHT CONTROL IN SPECIAL OVERSIZE/OVERWEIGHT PERMITS

PART I PROBLEM STATEMENT

The Ministry's present policy covering the issuing of Special Overweight Permits does not incorporate suitable axle weight or axle group weight controls.

The current practice is still largely governed by gross vehicle weight and is not in keeping with, or properly related to, the present axle weight requirements of The Highway Traffic Act.

Under this practice, there are a significant number of trips allowed with axle weights which are causing premature damage to roads and bridges.

PART II BACKGROUND INFORMATION

Special Overweight Permits are granted on a basis of single trips, specific projects, annual use, and for particularly heavy loads which require the setting of unique requirements for the load and trip in question.

The principle governing the Special Overweight Permit procedure is the recognition that there are certain types of loads that are not divisible, and for economic reasons should be granted permission to travel under control, even though their weight or dimensions are sometimes appreciably over the current restrictions under The Highway Traffic Act.

In 1978, the Research and Development Branch developed a set of Guidelines based on current design

standards for highway bridges and pavements, and using actual vehicle load surveys. The basis of weight limits in these guidelines, hereafter called Guidelines #1, is:

(a) From bridge considerations, the Ontario Highway Bridge Design Load which is based on the Ontario Bridge Formula plus 10 000 kg. The Ontario Bridge Formula is the basis of legal weight limits prescribed in Part VII of The Highway Traffic Act.

(b) From pavement considerations, an overweight of 50% for single trip moves, and 25% for multi-trip moves, in excess of the legal weight limits on axle units and axle groups as prescribed in Part VII of the Highway Traffic Act. In addition, the wheel pressure must not exceed the limit of 11 kg per millimetre of tire width as prescribed in Part VII of The Highway Traffic Act.

Resulting criteria are given in Table 1.

An Oversize/Overweight Permit Review Committee, consisting of the MTC officials and representatives from the Industry, Municipalities, O.P.P., OTA and ORBA, was formed in 1979. The first meeting was held in June 1979.

The Committee had two main objectives.

1. To review all aspects of O/O permit procedures and requirements.
2. To apply the axle weight control, properly related to the Axle Weight Legislation, to O/O permits.

With these objectives in mind, the Committee was asked to submit any or all problems with the existing procedures, and to recommend changes. Guidelines No. 1 were presented and explained, and industry was requested to study and review the guidelines and to submit potential problems and the impact on their business.

Other than the response from some crane operators that Guidelines No. 1 would put them out of business, there were few responses from the industry even with two deferrals to the submission dates. It was then necessary to hire a consultant (IBI) to survey the industry and estimate the impact on their business and recommend ways of minimizing that impact.

The Committee, however, did achieve some success in revising the procedures and conditions of the O/O permit. The Committee made six recommendations (listed below) to Safety and Regulation. All were accepted and were mostly all implemented, except the Lousiana permit issue system that will require work and time to implement:

1. Adopt the Louisiana permit issue system.
2. Simplify flag requirements on dimensional loads.
3. Allow built-up loads if all other aspects of the vehicle, other than the original overdimension, do not exceed H.T.A. requirements.
4. Relax restrictions on weekends and holidays by

allowing local discretion.

5. Allow "own escort" or escort service other than OPP escort.
6. Establish a standard for signs on O/O vehicles across Canada.

Clarification of policy and minor modifications were proposed and accepted, as follows:

a) Vehicle extension to support the load fully.
b) Better communications between engineering staff and licensing and enforcement staff.
c) A uniform policy for bulldozer blade removal and carrying the blade and minor parts on one load.
d) Radio or C.B. contact be required between the escort vehicle and the load vehicle.

The consultant estimated the impact of implementing Guidelines No. 1 as follows:

- Heavy haulers would have to upgrade their equipment by replacing tandem axle low-bed trailers with tri-axle trailers, and/or using wider tires.

- Approximately 30 mobile cranes would have to be replaced for failing to comply with the Guidelines. Some other mobile cranes would require larger tires or boom dollies.

  Both sectors of the industry will have to perform additional stripping of loads or mobile cranes.

- There is no significant restriction imposed on Annual Permits. On the other hand, the Guidelines would permit higher gross vehicle weights making it easier for the Annual Permits.

- Cost to the industry for single trip permits would be as follows:

	Initial Cash Flow	Economic Loss	Additional Annual Costs
	(current million dollars)		
Heavy Haulers	8.1	3.2	1.0
Mobile Cranes	9.4	3.0	1.8
	17.5	6.2	2.8

In order to reduce the impact on the industry, the consultant suggested the following potential actions for consideration:

1. Allow axle loads to exceed the proposed limits in Guidelines No. 1 by some fixed amount, while maintaining the same gross vehicle weight limits. The consultant studied the reduction in economic impact on the industry resulting from an increase in axle weight limits beyond Guidelines No. 1 by, 1000 kg for a single axle, 2000 kg for a dual axle, 2500 kg for a triple axle, and an increase in permissible pressure from 11 kg to 12 kg per millimetre of tire width. These increases would result in higher axle weights than those dictated by the bridge and pavement design standards.
2. Provide financial assistance to the industry to encourage the development and use of equipment which would meet the operational needs of the industry while complying with the proposed guidelines. This would be a trade-off by reducing MTC maintenance and replacement costs on pavement and structures.
3. Grandfather existing heavy hauling equipment and mobile cranes which cannot comply with the proposed guidelines.

The equipment would be stripped to minimize the weight

as much as reasonably possible. Grandfathering is proposed only for the Single Trip Permits. The basis of grandfathering is as follows:

"Equipment, for which a permit could be issued under current practice, but would be restricted by the proposed guidelines, may be permitted to operate for the balance of its economic life without axle weight control, but under the current gross vehicle weight limits for the single trip permits."

On the basis of an evaluation of Single Trip Permits issued during the year 1979, it is estimated that in case Guidelines No. 1 are adopted, there may be 3000 to 4000 grandfathering requests for the floats and 80 to 130 requests for the mobile cranes.

In order to reduce the economic impact and hardship on the industry, proposed guidelines were reviewed and revised and a new set of guidelines, hereafter called Guidelines #2, was developed. Guidelines #2 have higher weight limits on axles and axle groups compared to Guidelines #1.

The Basis for weight limits in Guidelines No. 2 is:

(a) From bridge considerations, the Ontario Highway Bridge Design Load which is based on the Ontario Bridge Formula plus 10 000 kg.

(b) From pavement considerations, an overweight of 5000 kg per axle for single trip moves, and 2500 kg per axle for the multi-trip moves, in excess of the legal weight limits on axle units and axle groups as prescribed in Part VII of The Highway Traffic Act.

In addition, the wheel pressure must not exceed the limit of 11 kg per millimetre of tire width as prescribed in Part VII of The Highway Traffic Act.

(SEE TABLE 1 FOR COMPARISONS OF GUIDELINES NO. 1 and 2)

In case Guidelines No. 2 are adopted, there may be 1500 to 2400 Grandfathering requests for the floats and 50 to 85 requests for the cranes.

PART III OPTIONS FOR AXLE WEIGHT CONTROL

OPTION 1: Continue existing practice

OPTION 2: Strictly implement the Guidelines No. 1

OPTION 3: Strictly implement the Guidelines No. 2

OPTION 4: Implement Guidelines No. 1, but grandfather the existing equipment not meeting the requirements of Guidelines No. 1 but permissible under existing practice. All new equipment is to conform to Guidelines No. 1.

OPTION 5: Implement Guidelines No. 2, but grandfather the existing equipment not meeting the requirements of Guidelines No. 2 but permissible under existing practice. All new equipment is to conform to Guidelines No. 2.

OPTION 6: Implement Guidelines No. 2, but grandfather the existing equipment not meeting the

requirements of Guidelines No. 2 but permissible under existing practice. All new equipment to conform to Guidelines No. 1 which is to be implemented at the end of grandfathering period.

Table 2 gives a summary of economic impact of the various options on the Industry and the Ministry.

PART IV RATING OF OPTIONS:

The options are rated from three perspectives:

1. The ministry's
2. The industry's
3. The user's

From the Ministry's perspective, technical basis of weight control consistent with the technical design standards for the highway system, and a proper relationship with the axle weight legislation, is most important in order to protect the taxpayer's investment in the system.

From the Industry's perspective, immediate hardship to some sectors and additional economic costs are of the greatest concern.

From the user's (Ministry is one of the users) perspective, concern is regarding increased cost of operation.

Table 3 gives rating of the seven options. Option 1 does not resolve the Ministry's concern. On the other hand, options 2 and 3 could result in serious hardship to the Industry, and increased cost of moving heavy equipment. A fair balance is achieved for options 4, 5, and 6, which represent a family of alternative solutions

each requiring grandfathering. Among options 4, 5, and 6, option 5 is most desirable.

TABLE 1

COMPARISON OF THE GUIDELINES NO. 1 & 2

	Guidelines No. 1		Guidelines No. 2	
	Single Trip	Annual, Project, Two Vehicle Concept	Single Trip	Annual, Project, Two-Vehicle Concept
Pressure per mm width of tire	11 kg	11 kg	11 kg	11 kg
Single axle	15 000 kg	12 500 kg	15 000 kg	12 500 kg
*Dual axle or two -axle group	50% over HTA (7700 to 9550 kg)	25% over HTA (3850 to 4800 kg)	10 000 kg over HTA	5000 kg over HTA
*Triple axle or three axle group	50% over HTA or 10 000 kg over HTA, whichever is smaller (9750 to 10 000 kg)	25% over HTA (4900 to 7150 kg)	10 000 kg over HTA	7500 kg over HTA
*Four axle group	10 000 kg over HTA	25% over HTA (5900 to 9500 kg)	10 000 kg over HTA	10 000 kg over HTA
Gross vehicle weight	10 000 kg over Ontario Bridge formula	25% or 10 000 kg over Ontario Bridge Formula, whichever is smaller	10 000 kg over Ontario Bridge Formula	25% or 10 000 kg over Ontario Bridge formula, whichever is smaller

* INDICATES DIFFERENCE IN THE TWO GUIDELINES

TABLE 2
RELATIVE ECONOMIC IMPACT OF THE OPTIONS

S. NO.	OPTIONS	COST TO THE INDUSTRY (MILLIONS OF CURRENT $)			ANNUAL COST TO THE MINISTRY (MILLIONS OF CURRENT $)	
		cash flow	economic loss	annual	bridges	pavement
1	Continue existing practice (Base for cost to the Industry)	0	0	0	5.0	0.3
2	Proposed Guidelines #1 (Base for cost to the Ministry)	17.5	6.2	2.8	0	0
3	Proposed Guidelines #2	11.2	4.0	2.5	0.5	0.1
4	Guidelines #1 together with grandfathering, all new equipment to comply with Guidelines #1	0.5	0.1	2.7	during grandfather period, 2.0 thereafter 0.5	0.3 0.1
5	Guidelines #2 together with grandfathering, all new equipment to comply with Guidelines #2	0.5	0.1	2.4	during grandfather period, 2.0 thereafter 1.0	0.3 0.2
6	Presently Guidelines #2 together with grandfathering; guidelines #1 in future after grandfathering period ends, all new equipment to comply with Guidelines #1	0.5	0.1	2.5	during grandfathering period 2.0 thereafter 0.8	0.3 0.1

TABLE 3.

RATING OF THE OPTIONS

NO.	OPTION	MINISTRY'S PERSPECTIVE					INDUSTRY'S PERSPECTIVE				USER'S PERSPECTIVE	TOTALS		
		TECHNICAL	ECONOMIC	REGULATORY	POLITICAL	ADMINISTRATIVE	HARDSHIP	ECONOMIC	ACCEPTABILITY	OPERATIONAL		MINISTRY	INDUSTRY	USER
		25	10	5	5	5	20	10	5	5	10	50	40	10
1	Continue existing practice	0	0	0	3	4	20	10	4	4	8	7	38	8
2	Proposed guidelines #1	25	10	5	1	3	0	0	1	2	2	44	3	2
3	Proposed guidelines #2	20	8	5	2	3	5	3	1	2	5	38	11	5
4	Guidelines #1 together with grandfathering	12	3	3	4	1	16	6	4	2	7	23	28	7
*5	Guidelines #2 together with grandfathering	10	1	3	5	2	18	7	4	3	9	21	32	9
6	Presently, guidelines #2 together with grandfathering; guidelines #1 for new equipment	11	2	2	3	1	17	7	3	2	8	19	29	8

* Option # 5 is the most desired option